WEST Search History

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DATE: Thursday, September 07, 2006

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		DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI; PLUR=YES; OP=ADJ	
☐	L7	(vitamin adj B6) same L1	27
☐	L6	(vitamin adj B6) same L4	1
☐	L5	vitamin same L4	2
☐	L4	(clone or recombinant) same L3	21
☐	L3	express$5 same L2	151
☐	L2	(gene or sequence or polynucleotide) same L1	251
☐	L1	((erythronate-4-phosphate adj dehydrogenase)or (4-phosphoerythronate adj dehydrogenase)or (phosphoerythonate adj dehydrogenase) or pdx?)	815

END OF SEARCH HISTORY

NiceZyme View of ENZYME: EC 1.1.1.290

Official Name

4-phosphoerythronate dehydrogenase.

Alternative Name(s)

4-O-phosphoerythronate dehydrogenase.

4PE dehydrogenase.

Erythronate-4-phosphate dehydrogenase.

Reaction catalysed

4-phospho-D-erythronate + NAD(+) <=> (3R)-3-hydroxy-2-oxo-4-phosphonooxybutanoate + NADH

Comment(s)

- This enzyme catalyzes the second step in the biosynthesis of the coenzyme pyridoxal 5'-phosphate in Escherichia coli.
- The reaction occurs predominantly in the reverse direction.
- Other enzymes involved in this pathway are EC 1.2.1.72, EC 2.6.1.52, EC 1.1.1.262, E 2.6.99.2 and EC 1.4.3.5.

Cross-references

PROSITE	PDOC00063
BRENDA	1.1.1.290
PUMA2	1.1.1.290
PRIAM enzyme-specific profiles	1.1.1.290
Kyoto University LIGAND chemical database	1.1.1.290
IUBMB Enzyme Nomenclature	1.1.1.290
IntEnz	1.1.1.290
MEDLINE	Find literature relating to 1.1.1.290
MetaCyc	1.1.1.290

Q8A2E4, PDXB_BACTN; Q7VRU9, PDXB_BLOFL; Q83AR8, PDXB_COXBU;
Q8XCR0, PDXB_ECO57; Q8FFH2, PDXB_ECOL6; P05459, PDXB_ECOLI;
Q6D2N5, PDXB_ERWCT; Q7N2B2, PDXB_PHOLL; Q6LNU2, PDXB_PHOPR;
Q7MV70, PDXB_PORGI; Q9I3W9, PDXB_PSEAE; Q88L20, PDXB_PSEPK;

KEGG ENZYME: 1.1.1.290

Help

Entry EC 1.1.1.290 Enzyme

Name 4-phosphoerythronate dehydogenase;
PdxB;
PdxB 4PE dehydrogenase;
4-O-phosphoerythronate dehydrogenase

Class Oxidoreductases
Acting on the CH-OH group of donors
With NAD+ or NADP+ as acceptor

Sysname 4-phospho-D-erythronate:NAD+ 2-oxidoreductase

Reaction 4-phospho-D-erythronate + NAD+ =
(3R)-3-hydroxy-2-oxo-4-phosphonooxybutanoate + NADH + H+
[RN:R04210]

Substrate 4-phospho-D-erythronate [CPD:C03393];
NAD+ [CPD:C00003]

Product (3R)-3-hydroxy-2-oxo-4-phosphonooxybutanoate [CPD:C06054];
NADH [CPD:C00004];
H+ [CPD:C00080]

Comment This enzyme catalyses the second step in the biosynthesis of the coenzyme pyridoxal 5'-phosphate in Escherichia coli. The reaction
occurs predominantly in the reverse direction [3]. Other enzymes involved in this pathway are EC 1.2.1.72 (erythrose-4-phosphate dehydrogenase), EC 2.6.1.52 (phosphoserine transaminase), EC 1.1.1.262 (4-hydroxythreonine-4-phosphate dehydrogenase), EC 2.6.99.2 (pyridoxine 5'-phosphate synthase) and EC 1.4.3.5 (pyridoxamine-phosphate oxidase).

Reference

1 [PMID:2121717]
Lam HM, Winkler ME.
Metabolic relationships between pyridoxine (vitamin B6) and serine
biosynthesis in Escherichia coli K-12.
J. Bacteriol. 172 (1990) 6518-28.
2 [PMID:11844765]
Pease AJ, Roa BR, Luo W, Winkler ME.
Positive growth rate-dependent regulation of the pdxA, ksgA, and pdxB genes of Escherichia coli K-12.
J. Bacteriol. 184 (2002) 1359-69.
3 [PMID:8550422]
Zhao G, Winkler ME.
A novel alpha-ketoglutarate reductase activity of the serA-encoded
3-phosphoglycerate dehydrogenase of Escherichia coli K-12 and its
possible implications for human 2-hydroxyglutaric aciduria.
J. Bacteriol. 178 (1996) 232-9.
4 [PMID:2692566]